



**Air Quality**  
**PERMIT TO CONSTRUCT**  
**State of Idaho**  
**Department of Environmental Quality**

**PERMIT No.:** P-2008.0049

**FACILITY ID No.:** 005-00058

**AQCR:** 61

**CLASS:** SM

**SIC:** 3339

**ZONE:** 12

**UTM COORDINATE (km):** 377.8, 4,750.3

**1. PERMITTEE**

Hoku Materials, Inc.

**2. PROJECT**

PTC Modification for Polysilicon Production Facility

**3. MAILING ADDRESS**

One Hoku Way

**CITY**

Pocatello

**STATE**

ID

**ZIP**

83204

**4. FACILITY CONTACT**

Karl Taft

**TITLE**

Chief Technology Officer

**TELEPHONE**

808-682-7800

**5. RESPONSIBLE OFFICIAL**

Karl Taft

**TITLE**

Chief Technology Officer

**TELEPHONE**

808-682-7800

**6. EXACT PLANT LOCATION**

One Hoku Way – Site near South Philbin Road

**COUNTY**

Bannock

**7. GENERAL NATURE OF BUSINESS & KINDS OF PRODUCTS**

Polysilicon Production Facility

**8. PERMIT AUTHORITY**

This permit is issued according to the Rules for the Control of Air Pollution in Idaho, IDAPA 58.01.01.200 through 228, and pertains only to emissions of air contaminants regulated by the state of Idaho and to the sources specifically allowed to be constructed or modified by this permit.

This permit (a) does not affect the title of the premises upon which the equipment is to be located; (b) does not release the permittee from any liability for any loss due to damage to person or property caused by, resulting from, or arising out of the design, installation, maintenance, or operation of the proposed equipment; (c) does not release the permittee from compliance with other applicable federal, state, tribal, or local laws, regulations, or ordinances; (d) in no manner implies or suggests that the Department of Environmental Quality (DEQ) or its officers, agents, or employees, assume any liability, directly or indirectly, for any loss due to damage to person or property caused by, resulting from, or arising out of design, installation, maintenance, or operation of the proposed equipment.

This permit will expire if construction has not begun within two years of its issue date or if construction is suspended for one year.

This permit has been granted on the basis of design information presented with its application. Changes in design, equipment or operations may be considered a modification. Modifications are subject to DEQ review in accordance with IDAPA 58.01.01.200 through 228 of the Rules for the Control of Air Pollution in Idaho.

**DAN PITMAN, PERMIT WRITER**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**

**DATE ISSUED:**

August 14, 2007

**DATE MODIFIED:**

Proposed

**DATE EXPIRED:**

August 14, 2012

**MIKE SIMON, STATIONARY SOURCE PROGRAM**  
**MANAGER**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**

## Table of Contents

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE .....	3
1. PERMIT TO CONSTRUCT SCOPE.....	4
2. FACILITY EMISSION CAP CONDITIONS.....	5
3. METALLURGICAL SILICON STORAGE AND TRANSFER/LIME SILO .....	9
4. EMERGENCY GENERATOR AND FIREWATER PUMP.....	11
5. POLYSILICON PRODUCTION.....	13
6. NATURAL GAS FIRED HOT OIL HEATER AND BOILER.....	16
7. LABORATORY SCRUBBER.....	17
8. PERMIT TO CONSTRUCT GENERAL PROVISIONS .....	19

## Acronyms, Units, and Chemical Nomenclature

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
HAPs	hazardous air pollutants
HCl	Hydrogen Chloride
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MMBtu	million British thermal units
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
O&M	Operations and Maintenance
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	permit to construct
SIC	Standard Industrial Classification
SO <sub>2</sub>	sulfur dioxide
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b> <b>Date Expires:</b>	<b>[proposed]</b> August 14, 2012

## 1. PERMIT TO CONSTRUCT SCOPE

### *Purpose*

- 1.1 This permit modification authorizes the construction and operation of a 4,000 metric ton per year polysilicon manufacturing plant instead of a 2,500 metric ton per year plant that was initially permitted on August 14, 2007. This permit establishes a Facility Emissions Cap for criteria and hazardous air pollutants. The permit allows changes that comply with the terms and conditions of this permit and that meet the requirements of IDAPA 58.01.01.181.

[proposed]

### *Regulated Sources*

- 1.2 Table 1.1 lists all sources of regulated emissions in this PTC.

**Table 1.1 SUMMARY OF REGULATED SOURCES**

Permit Section	Source Description	Emissions Control(s)
2	<u>Facility Emission Cap</u> The facility emissions cap applies to all regulated sources at the facility, including boilers, generators, and manufacturing operations.	Varies – see Table 2.1
3	Metallurgical Silicon Storage and Transfer/Lime Silo	Baghouses
4	Emergency Generator and Fire Water Pump	None
5	Polysilicon Production	Wet Scrubbers
6	Hot Oil Heater and Boiler	Combust Natural Gas Exclusively
7	Laboratory	Wet Scrubber

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b> <b>Date Expires:</b>	[proposed] August 14, 2012

## 2. FACILITY EMISSION CAP CONDITIONS

This permit authorizes construction of a 4,000 metric ton per year polysilicon manufacturing plant and changes to the facility which complies with the terms and conditions of this permit and the requirements of IDAPA 58.01.01.181.

[proposed]

**Table 2.1 FACILITY EMISSIONS DESCRIPTION**

Emissions Unit(s) / Process(es)	Emissions Control Device
Silicon Storage Bin	Baghouse
Primary Silicon Feed Bin	Baghouse
Secondary Silicon Feed Bin	Baghouse
Lime Silo	Baghouse
Polysilicon Production <ul style="list-style-type: none"> <li>• HCl storage and transfer</li> <li>• Trichlorosilane Production</li> <li>• Trichlorosilane Purification</li> <li>• Trichlorosilane Storage</li> <li>• Polysilicon Reaction</li> <li>• Silicon Tetrachloride storage and Hydrogenation</li> <li>• Vent Gas Recovery</li> </ul>	Chlorosilane Scrubber
Hot Oil Heater	None
Boiler	None
Emergency Generator	None
Diesel Firewater Pump	None
Cooling Tower	None
Relief Vent Valves	Relief Vent Valve Scrubber
Laboratory	Laboratory Scrubber

### ***Emissions Limits***

#### **2.1 Criteria Pollutant and HAP Facility Emissions Cap**

Emissions from the Hoku Materials facility shall not exceed any corresponding facility emission cap (FEC) limits listed in Table 2.2.

**Table 2.2 FEC EMISSIONS LIMITS<sup>1</sup>**

Source Description	PM/ PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	Individual HAP	Aggregated HAPs
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Total Facility Emissions Cap	24.56	6.53	83.03	5.49	46.09	5.83	6.72

1) Emission limits are in tons per consecutive 12-calendar month period.

[proposed]

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b> <b>Date Expires:</b>	[proposed] August 14, 2012

### ***Facility Emissions Cap Monitoring and Recordkeeping Requirements***

#### **2.2 Hot Oil Heater and Boiler**

The permittee shall monitor and record the amount of natural gas consumed each calendar month. The permittee shall calculate and record rolling 12-calendar month NO<sub>x</sub>, CO, SO<sub>2</sub>, VOC, PM<sub>10</sub>, PM, maximum individual HAP and aggregated HAP emissions based on fuel consumption for natural gas combustion sources and U.S. EPA AP-42 emission factors.

#### **2.3 Metallurgical Silicon Storage and Handling/Lime Storage Silo**

- 2.3.1 The permittee shall maintain documentation on-site of the flow rate of vent gases from the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper and Lime Storage Silo vent. The flow rate shall be recorded in dry standard cubic feet per minute (dscf/min).
- 2.3.2 The permittee shall maintain documentation on-site of manufacturer guarantees that each of the baghouses controlling emissions from the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper, and Lime Storage Silo vent will control PM<sub>10</sub> emissions at a rate of 0.02 grains per dry standard cubic foot (gr/dscf) or less.
- 2.3.3 The permittee shall calculate a pound per hour emission rate by multiplying the manufacturer guaranteed emissions in grains per dry standard cubic foot by the flow rate of vent gases in dry standard cubic feet. The permittee shall record the result in pounds per hour of PM and PM<sub>10</sub> emissions for the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper, and Lime Storage Silo vent.
- 2.3.4 The permittee shall monitor and record the hours of operation of the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper and Lime Storage Silo vent each calendar month.
- 2.3.5 Each month the permittee shall calculate and record rolling 12-calendar month total PM and PM<sub>10</sub> emissions from the Silicon Bin Vent, Silicon Primary Hopper, Silicon Secondary Hopper, and Lime Storage Silo vent.

#### **2.4 Emergency Generator and Fire Water Pump**

- 2.4.1 The permittee shall monitor and record the hours of operation of the Emergency Generator and the Fire Water Pump engine each calendar month.
- 2.4.2 Each calendar month the permittee shall calculate and record the rolling 12-calendar month NO<sub>x</sub>, CO, SO<sub>2</sub>, VOC, PM<sub>10</sub>, PM, maximum individual HAP, and aggregated HAP emissions based on hours of operation and U.S. EPA AP-42 emission factors.

#### **2.5 Cooling Tower**

Once each calendar month the permittee shall collect a sample of the cooling towers recirculating water and shall have it analyzed for total dissolved solids (TDS). Monitoring and recordkeeping shall comply with Permit to Construct General Provision 7. Each month the permittee shall calculate and record the rolling 12-calendar month PM and PM<sub>10</sub> emissions based on the monitored TDS concentration and U.S. EPA AP-42 emissions factors.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b> <b>Date Expires:</b>	[proposed] August 14, 2012

## 2.6 Polysilicon Production Emissions

The permittee shall continuously monitor and record hydrogen chloride (HCl) emissions from the chlorosilane scrubber in accordance with Permit Condition 5.6. Each calendar month the permittee shall calculate and record the rolling 12-calendar month HCl emissions.

## 2.7 Relief Valve Vent Scrubber & Laboratory Scrubber

Each month the permittee shall calculate and record the rolling 12-calendar month emissions from the Relief Valve Vent Scrubber and the Laboratory Scrubber. The permittee shall maintain documentation on site of the emission estimates. The documentation shall include any assumptions made and the calculations used to obtain the emission estimates.

## 2.8 Fugitive HCl Emissions (Valves, Seals, etc.)

The permittee shall calculate fugitive HCl emissions based on Alcon Leak factors or DEQ approved alternative leak factors. The permittee shall maintain documentation on site that includes the HCl leak factors and the emission estimate calculations. The emission estimates shall be in units of pounds per calendar month. The documentation shall be made available to DEQ representatives upon request.

## 2.9 Facility-Wide Emissions

Monthly estimates of facility-wide actual emissions shall be aggregated to obtain a rolling 12-calendar month emissions total for each pollutant to demonstrate compliance with the annual emission limits in Permit Condition 2.1. Records shall be maintained on site for a period of at least five years and shall be made available to DEQ representatives upon request.

# **Reporting Requirements**

## 2.10 Reporting

The permittee shall report to DEQ the rolling 12-month total criteria pollutant and HAP emissions recorded under Permit Condition 2.9. The report shall be for the period July 1<sup>st</sup> through June 30<sup>th</sup> and shall be due on or before September 1<sup>st</sup> of each calendar year. All reports must be certified in accordance with General Provision 9 of this permit.

# **General FEC Conditions**

## 2.11 Notice and Record-Keeping of Estimates of Ambient Concentrations

2.11.1 For facility changes that comply with the terms and conditions establishing the FEC, but are not included in the estimate of ambient concentration analysis approved for the permit establishing the FEC, the permittee shall review the estimate of ambient concentration analysis. In the event the facility change would result in a significant contribution above the design concentration determined by the estimate of ambient concentration analysis approved for the permit establishing the FEC, but does not cause or significantly contribute to a violation to any ambient air quality standard, the permittee shall provide notice to DEQ in accordance with IDAPA 58.01.01.181.01.b. The permittee shall record and maintain documentation of the review on site.

2.11.2 Estimates of ambient concentrations shall be consistent with the estimate of ambient concentration analysis approved for the permit establishing the FEC unless DEQ determines that other technical methods are appropriate. Ambient impact analyses conducted by the permittee to comply with IDAPA

<b>AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049</b>				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b> <b>Date Expires:</b>	<b>[proposed]</b> August 14, 2012

58.01.01.181 after December 9, 2006 shall be performed using the most current EPA-approved regulatory guideline model (such as AERMOD-Prime). The permittee is strongly encouraged to submit a modeling protocol to DEQ for review and approval prior to conducting the first modeling analyses based on the regulatory air model that is used to comply with IDAPA 58.01.01.181. The permittee shall include any changes to the facility that was not included in the originally approved estimate of ambient concentration analysis.

- 2.11.3 The permittee shall submit a revised ambient impact modeling analysis using the most current regulatory air model for the renewal of this permit in accordance with IDAPA 58.01.01.177.02.d and IDAPA 58.01.01.179.02. The permittee is strongly encouraged to submit a modeling protocol to the Department for review and approval prior to submitting the modeling analysis with the FEC permit renewal application.



**AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049**

<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

**3. METALLURGICAL SILICON STORAGE AND TRANSFER/LIME SILO****3.1 Process Description**

Metallurgical grade silicon from offsite transport vehicles is transferred to and stored in a bin; the bin feeds a primary and secondary feed hopper. The feed hoppers send metallurgical grade silicon to the polysilicon manufacturing process. Emissions from the bin and hoppers are controlled by a baghouse dedicated to each unit.

Lime from offsite transport vehicles is transferred to and stored in a silo. Emissions from the lime silo are controlled by a baghouse.

**Table 3.1 METALLURGICAL SILICON HANDLING/LIME SILO DESCRIPTION**

Emissions Units	Emissions Control Device
Silicon Bin	Baghouse
Primary Silicon Feed Bin	Baghouse
Secondary Silicon Feed Bin	Baghouse
Lime Silo	Baghouse

***Emissions Limits*****3.2 Emissions Limits**

PM and PM<sub>10</sub> emissions from each baghouse on the Silicon Bin, Primary Silicon Feed Bin, Secondary Feed Bin, and the Lime Silo shall not exceed 0.02 grains per dry standard cubic foot.

**3.3 Opacity Limit**

Emissions from any stack, vent, or functionally equivalent opening shall not exceed 20% opacity for a period or periods aggregating more than three minutes in any 60-minute period as required by IDAPA 58.01.01.625. Opacity shall be determined by the procedures contained in IDAPA 58.01.01.625.

***Operating Requirements*****3.4 Baghouse Specifications**

The permittee shall install and operate baghouses on the Silicon Bin, Primary Silicon Feed Bin, Secondary Feed Bin, and the Lime Silo that are guaranteed by the manufacturer to emit no more than 0.02 grains per dry standard cubic foot of PM<sub>10</sub>. The permittee shall maintain documentation of the manufacturer guarantees on site and shall make them available to DEQ representatives upon request.

**3.5 Baghouse Operation and Maintenance Manual**

Within 60 days of permit issuance, the permittee shall have developed an Operations and Maintenance (O&M) manual for the baghouses which control the PM and PM<sub>10</sub> emissions from the Silicon Bin, Primary Silicon Feed Bin, Secondary Feed Bin, and the Lime Silo. The O&M manual shall describe the procedures that will be followed to comply with General Provision 2 and the manufacturer specifications for the baghouse. The manual shall contain, at a minimum, requirements for semiannual inspection of the baghouse. The inspections shall include, but not be limited to, checking the bags or

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

cartridges for structural integrity and that they are appropriately secured in place. The manual shall remain on site at all times and shall be made available to DEQ representatives upon request.

The operating and monitoring requirements specified in the O&M manual are incorporated by reference to this permit and are enforceable permit conditions.

The O&M manual shall be submitted to DEQ at the following address. Any changes made to the O&M manual shall also be submitted.

Air Quality Permit Compliance  
Department of Environmental Quality  
Pocatello Regional Office  
444 Hospital Way, #300  
Pocatello, ID 83201

### ***Monitoring and Recordkeeping Requirements***

#### **3.6 Baghouse Inspections**

The permittee shall maintain documentation on site of the results of the semiannual baghouse inspections required by the Baghouse Operations and Maintenance Manual. The results of the inspection shall be documented and shall at minimum include statements about the structural integrity of the bags and whether they are appropriately secured in place. Monitoring shall comply with Permit to Construct General Provision 7.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

#### 4. EMERGENCY GENERATOR AND FIREWATER PUMP

##### 4.1 Process Description

The permittee will install an emergency generator that is powered by a diesel fuel engine and a fire water pump that is powered by a diesel fuel engine.

**Table 4.1 GENERATOR AND FIRE PUMP ENGINE DESCRIPTION**

Emissions Units	Emissions Control Device
Emergency Generator Set Power: 3,500 kW Model Year: To be determined	None
Fire Pump Engine Power: 800 HP Model Year: To be determined	

[proposed]

#### ***Emissions Limits***

##### 4.2 40 CFR 60.4200 Emissions Limits For Compression Ignition Engines

- 4.2.1 Emissions from the emergency generator must comply with the emission standards for new nonroad compression ignition engines in 40 CFR 60.4202 and 60.4205.
- 4.2.2 Emissions from certified National Fire Protection Association fire pump engines after July 1, 2006 must comply with the emission standards in Table 4 to 40 CFR 60.4200.

#### ***Operating Requirements***

##### 4.3 40 CFR 60.4206 Operating Requirements

Owners and operators of stationary compression ignition engines subject to emissions standards of 40 CFR 60.4205 shall achieve the emissions standards according the manufacturer's written instruction or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

##### 4.4 40 CFR 60.4207 Fuel Requirements

- 4.4.1 Beginning October 1, 2007, owners and operators of stationary compression engines subject to 40 CFR 60.4200 using diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a):
- Sulfur content – 500 ppm
  - Cetane index of 40, or a maximum aromatic content of 35 volume percent
- 4.4.2 Beginning October 1, 2010, owners and operators of stationary compression engines subject to 40 CFR 60.4200 with cylinder displacements less than 30 liters using diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel.
- Sulfur content – 15 ppm
  - Cetane index of 40, or a maximum aromatic content of 35 volume percent

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

#### **4.5 40 CFR 60.4208 Installation Requirements**

After December 31, 2008, owners and operators may not install stationary compression ignition engines that do not meet the applicable requirements for 2007 model year engines.

#### **4.6 40 CFR 60.4211 Compliance Requirements**

- 4.6.1 In accordance with 40 CFR 60.4211(a) owners and operators must operate and maintain the stationary compression internal combustion engine according to the manufacturer's written instruction or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. Owners and operators must also meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.
- 4.6.2 In accordance with 40 CFR 60.4211(c) the owner and operator of a 2007 model year and later emergency generator subject to the emission standards of 40 CFR 60.4002(b) must comply by purchasing an engine certified to the standards of 40 CFR 60.4002(b), for the same model year and maximum engine power. The engine must be installed and configured to the manufacturer's specifications.
- 4.6.3 In accordance with 40 CFR 60.4211(e) emergency stationary internal combustion engines may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing is limited to 100 hours per year. There is no time limit on the use of emergency engines in emergency situations. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing beyond 100 hours per year. Any operation of the emergency generator other than emergency operation, and maintenance and testing as permitted in this section, is prohibited.

#### **4.7 Compliance with 40 CFR 60.200**

Should there be a conflict between Permit Conditions 4.2 through 4.9 and 40 CFR 60.4200, the Code of Federal Regulations shall govern.

### ***Monitoring and Recordkeeping Requirements***

#### **4.8 40 CFR 60.4209 Monitoring Requirements**

Owners and operators of stationary compression ignition engines subject to emissions standards of 40 CFR 60.4200 shall install a non-resettable hour meter prior to startup of the engine.

### ***Reporting Requirements***

#### **4.9 Reporting**

The permittee shall comply with all applicable notification requirements of 40 CFR 60.7:

- Notification of the date of construction and the heat input capacity of the affected units, no later than 30 days after such date;
- Notification of the date of initial startup, postmarked within 15 days of such date;
- Notification of any physical and operational changes which may increase emissions.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

## 5. POLYSILICON PRODUCTION

### 5.1 Process Description

Polysilicon is produced in a batch process where pure trichlorosilane gas and hydrogen are combined in reactors where silicon is deposited onto a filament rod inside the reactors. The process is called chemical vapor deposition. Off-gases from the reactors are sent to a vent gas recovery system that recycles the majority of the gases back into the process. The process consists of the emissions units listed in Table 5.1.

All of these processes may vent to the chlorosilane scrubber.

### 5.2 Emissions Control Description

**Table 5.1 POLYSILICON PRODUCTION DESCRIPTION**

Emissions Unit(s) / Process(es)	Emissions Control Device
Hydrochloric acid storage and transfer	Chlorosilane Scrubber
Trichlorosilane production	
Trichlorosilane storage	
Silicon tetrachloride storage	
Silicon tetrachloride hydrogenation	
Polysilicon reaction (chemical vapor deposition)	
Impurities removal	

## ***Emissions Limits***

### 5.3 Emissions Limits

Emissions from the Chlorosilane scrubber stack shall not exceed any corresponding emissions rate limits listed in Table 5.2.

**Table 5.2 CHLOROSILANE SCRUBBER EMISSIONS LIMITS<sup>1</sup>**

Source Description	HCl	Silicon Tetrahydride
	lb/day <sup>2</sup>	lb/hr <sup>3</sup>
Chlorosilane Scrubber	8.88	0.47

- 1) In absence of any other creditable evidence, compliance is assured by complying with this permits operating, monitoring and record keeping requirements.
- 2) Hydrogen chloride gas and hydrochloric acid as measured by an approved continuous emission monitor in pounds per calendar day.
- 3) As determined through an approved source testing method.

## ***Operating Requirements***

### 5.4 Polysilicon Production

Polysilicon production shall not exceed 4,000 metric tons per any consecutive 12-calendar month period.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

[proposed]

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

## ***Monitoring and Recordkeeping Requirements***

### **5.5 Polysilicon Monitoring**

Each month the permittee shall monitor and record the amount of polysilicon produced during the most recent consecutive 12-calendar month period.

### **5.6 HCl Continuous Emission Monitor**

The permittee shall install and operate a DEQ approved hydrogen chloride continuous emission monitor on the chlorosilane scrubber stack that will measure HCl emissions in a manner that will allow the permittee to calculate the total pounds emitted per calendar day. The permittee shall submit to DEQ for approval prior to startup a continuous emission monitoring protocol that shall, at a minimum, address the following:

- How the CEMS functions in the presence of water droplets/stack moisture.
- Performance test verification requirements, including the performance specification that will be used to verify CEMS performance. Verification testing shall occur no later than 60 days after startup.
- How the measured HCl concentration will be converted to pounds per calendar day to assure compliance with the HCl emission limit.
- How the stack gas flow rate will be determined.

### **5.7 Silicon Tetrahydride Emission Test**

Within 60 days of startup the permittee shall conduct a silicon tetrahydride performance test on the chlorosilane scrubber stack to demonstrate compliance with the silicon tetrahydride emission limit in Permit Condition 5.3. The performance test shall be conducted in accordance with a DEQ approved source testing protocol and in accordance with General Provision 6 of this permit.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

## 6. NATURAL GAS FIRED HOT OIL HEATER AND BOILER

### 6.1 Process Description

The permittee will operate a Hot Oil Heater and Boiler to provide for process heat needs.

### 6.2 Emissions Control Description

**Table 6.1 POLYSILICON PRODUCTION DESCRIPTION**

Emissions Unit(s) / Process(es)	Emissions Control Device
Hot Oil Heater Fuel: Natural Gas Size: 55 MMBtu/hr	None
Boiler Fuel: Natural Gas Size: 55 MMBtu/hr	

[proposed]

## ***Operating Requirements***

### 6.3 Fuel Limitations

The Hot Oil Heater and Boiler shall combust natural gas exclusively.

### 6.4 Compliance with 40 CFR 60.48c

Should there be a conflict between Permit Conditions 6.5 through 6.6 and 40 CFR 60.40c, the Code of Federal Regulations shall govern.

## ***Monitoring and Recordkeeping Requirements***

### 6.5 Fuel Monitoring - 40 CFR 60.48c(g)(1)

The permittee shall monitor the amount of natural gas combusted in each affected emission unit each day in accordance with 40 CFR 60.48c(g)(1) or may elect to: record and maintain records of the amount of fuel combusted during each calendar month in accordance with 40 CFR 60.48c(g)(2); or to record and maintain records of the total amount fuel delivered to that property during each calendar month in accordance with 40 CFR 60.48c(g)(3).

## ***Reporting Requirements***

### 6.6 Reporting

The permittee shall comply with all applicable notification requirements of 40 CFR 60.48c(a) and 40 CFR 60.7:

- Notification of the date of construction and the heat input capacity of the affected units, no later than 30 days after such date;
- Notification of the date of initial startup, postmarked within 15 days of such date;
- Notification of any physical and operational changes which may increase emissions.



**AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049**

<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b> <b>Date Expires:</b>	<b>[proposed]</b> August 14, 2012

**7. LABORATORY SCRUBBER****7.1 Process Description**

Emission from the laboratory will be controlled by a laboratory scrubber. Nitric acid and hydrofluoric acid is used for lab analysis and sample etching.

**7.2 Emissions Control Description****Table 7.1 LABORATORY DESCRIPTION**

Emissions Units	Emissions Control Device
Laboratory	Wet Scrubber

***Operating Requirements*****7.3 Nitric acid and Hydrofluoric Acid**

The permittee shall not use more than:

- 5 gallons of nitric acid per calendar day;
- 5 gallons of hydrofluoric acid per calendar day.

**7.4 Manufacturer Guarantee**

The permittee shall maintain documentation on site from the manufacturer that guarantees the laboratory scrubber will control nitric acid and hydrofluoric acid at a minimum of 90 percent removal efficiency. The manufacturer's guarantees shall be made available to DEQ representatives upon request.

**7.5 O & M Manual**

Within 60 days of permit issuance the permittee shall have developed and submitted to DEQ an Operations and Maintenance (O&M) manual for the wet scrubbers which describes the procedures that will be followed to comply with General Provision 2 of this permit and the manufacturer specifications for the air pollution control device. At a minimum the O&M manual shall contain the manufacturer's recommended minimum values that shall be maintained for each of the following operating parameters:

- Scrubbing media flow rate in gallons per minute,
- Scrubbing Media pH
- Pressure drop across scrubber in inches of water
- Requirements to monitor and record the parameters listed above no less frequently than once every two calendar weeks.

All monitoring records shall be maintained on site for a period of 5 years and shall be made available to DEQ representatives upon request.

The contents of the O&M manual shall be based on manufacturer's specifications. A copy of the manufacturer's specifications shall be included with the O&M manual and both shall be made available to DEQ representatives upon request.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

The operating and monitoring requirements specified in the O&M manual are incorporated by reference to this permit and are enforceable permit conditions.

The O&M manual shall be submitted to DEQ at the following address. Any changes made to the O&M manual shall also be submitted.

Air Quality Permit Compliance  
Department of Environmental Quality  
Pocatello Regional Office  
444 Hospital Way, #300  
Pocatello, ID 83201

### ***Monitoring and Recordkeeping Requirements***

#### **7.6     Nitric Acid and Hydrofluoric Acid**

The permittee shall monitor and record the gallons of nitric acid and hydrofluoric acid used per calendar day. The records shall be maintained on site for a period of five years and made available to DEQ representatives upon request.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

## 8. PERMIT TO CONSTRUCT GENERAL PROVISIONS

### *General Compliance*

1. The permittee has a continuing duty to comply with all terms and conditions of this permit. All emissions authorized herein shall be consistent with the terms and conditions of this permit and the Rules for the Control of Air Pollution in Idaho. The emissions of any pollutant in excess of the limitations specified herein, or noncompliance with any other condition or limitation contained in this permit, shall constitute a violation of this permit and the Rules for the Control of Air Pollution in Idaho, and the Environmental Protection and Health Act, Idaho Code §39-101, et seq.  
[Idaho Code §39-101, et seq.]
2. The permittee shall at all times (except as provided in the Rules for the Control of Air Pollution in Idaho) maintain in good working order and operate as efficiently as practicable, all treatment or control facilities or systems installed or used to achieve compliance with the terms and conditions of this permit and other applicable Idaho laws for the control of air pollution.  
[IDAPA 58.01.01.211, 5/1/94]
3. Nothing in this permit is intended to relieve or exempt the permittee from the responsibility to comply with all applicable local, state, or federal statutes, rules and regulations.  
[IDAPA 58.01.01.212.01, 5/1/94]

### *Inspection and Entry*

4. Upon presentation of credentials, the permittee shall allow DEQ or an authorized representative of DEQ to do the following:
  - a. Enter upon the permittee's premises where an emissions source is located or emissions related activity is conducted, or where records are kept under conditions of this permit;
  - b. Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
  - d. As authorized by the Idaho Environmental Protection and Health Act, sample or monitor, at reasonable times, substances or parameters for the purpose of determining or ensuring compliance with this permit or applicable requirements.

[Idaho Code §39-108]

### *Construction and Operation Notification*

5. The permittee shall furnish DEQ written notifications as follows in accordance with IDAPA 58.01.01.211:
  - a. A notification of the date of initiation of construction, within five working days after occurrence;
  - b. A notification of the date of any suspension of construction, if such suspension lasts for one year or more;

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

- c. A notification of the anticipated date of initial start-up of the stationary source or facility not more than sixty days or less than thirty days prior to such date;
- d. A notification of the actual date of initial start-up of the stationary source or facility within fifteen days after such date; and
- e. A notification of the initial date of achieving the maximum production rate, within five working days after occurrence - production rate and date.

[IDAPA 58.01.01.211, 5/1/94]

### ***Performance Testing***

- 6. If performance testing (air emissions source test) is required by this permit, the permittee shall provide notice of intent to test to DEQ at least 15 days prior to the scheduled test date or shorter time period as approved by DEQ. DEQ may, at its option, have an observer present at any emissions tests conducted on a source. DEQ requests that such testing not be performed on weekends or state holidays.

All performance testing shall be conducted in accordance with the procedures in IDAPA 58.01.01.157. Without prior DEQ approval, any alternative testing is conducted solely at the permittee's risk. If the permittee fails to obtain prior written approval by DEQ for any testing deviations, DEQ may determine that the testing does not satisfy the testing requirements. Therefore, at least 30 days prior to conducting any performance test, the permittee is encouraged to submit a performance test protocol to DEQ for approval. The written protocol shall include a description of the test method(s) to be used, an explanation of any or unusual circumstances regarding the proposed test, and the proposed test schedule for conducting and reporting the test.

Within 30 days following the date in which a performance test required by this permit is concluded, the permittee shall submit to DEQ a performance test report. The written report shall include a description of the process, identification of the test method(s) used, equipment used, all process operating data collected during the test period, and test results, as well as raw test data and associated documentation, including any approved test protocol.

[IDAPA 58.01.01.157, 4/5/00]

### ***Monitoring and Recordkeeping***

- 7. The permittee shall maintain sufficient records to ensure compliance with all of the terms and conditions of this permit. Records of monitoring information shall include, but not be limited to the following: (a) the date, place, and times of sampling or measurements; (b) the date analyses were performed; (c) the company or entity that performed the analyses; (d) the analytical techniques or methods used; (e) the results of such analyses; and (f) the operating conditions existing at the time of sampling or measurement. All monitoring records and support information shall be retained for a period of at least five years from the date of the monitoring sample, measurement, report, or application. Supporting information includes, but is not limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit. All records required to be maintained by this permit shall be made available in either hard copy or electronic format to DEQ representatives upon request.

[IDAPA 58.01.01.211, 5/1/94]

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-2008.0049				
<b>Permittee:</b>	Hoku Materials, Inc.	<b>Facility ID No.</b> 005-00058	<b>Date Issued:</b>	August 14, 2007
<b>Location:</b>	Pocatello, Idaho		<b>Date Modified:</b>	[proposed]
			<b>Date Expires:</b>	August 14, 2012

### ***Excess Emissions***

8. The permittee shall comply with the procedures and requirements of IDAPA 58.01.01.130-136 for excess emissions due to startup, shutdown, scheduled maintenance, safety measures, upsets and breakdowns.

[IDAPA 58.01.01.130-136, 4/5/00]

### ***Certification***

9. All documents submitted to DEQ, including, but not limited to, records, monitoring data, supporting information, requests for confidential treatment, testing reports, or compliance certification shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

[IDAPA 58.01.01.123, 5/1/94]

### ***False Statements***

10. No person shall knowingly make any false statement, representation, or certification in any form, notice, or report required under this permit, or any applicable rule or order in force pursuant thereto.

[IDAPA 58.01.01.125, 3/23/98]

### ***Tampering***

11. No person shall knowingly render inaccurate any monitoring device or method required under this permit or any applicable rule or order in force pursuant thereto.

[IDAPA 58.01.01.126, 3/23/98]

### ***Transferability***

12. This permit is transferable in accordance with procedures listed in IDAPA 58.01.01.209.06.

[IDAPA 58.01.01.209.06, 4/11/06]

### ***Severability***

13. The provisions of this permit are severable, and if any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.